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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/632,051
Filing Date: July 30, 2003
Appellant(s): GRONEMEYER ET AL.

Kenneth N. Nigon
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/22/10 appealing from the Office action mailed 7/2/10.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1-33 are rejected.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(**5) Summary of Claimed Subject Matter**

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(**8) Evidence Relied Upon**

US 2002/0142741	MOLNAR et al	3-2001
US 6,775,531	KAEWELL et al	6-2000
US 7,149,473	LINDLAR et al	1-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC ∋ 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented

and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims **1-13** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Molnar et al** (US 2002/0142741) in view of **Kaewell** et al (US 6,775,531) and **Lindlar** (US 7,149, 473).

Regarding claim **1**, **Molnar** discloses a radio frequency (RF) to baseband interface providing power control over an R.F section that processes RF signals and that is coupled to a baseband section that processes baseband signals, the interface comprising:

- a serial message interface (see Fig. 3 and [0047]) for communicating a power control message from the baseband section to the RF section that is associated with power consumption of the RF section as claimed (see [0058, 0064, 0072]), where data bits transfer to register of serial interface 332 and stored in data latches to program (control) RF integrated circuit 338 component would power up or power down components according to the component control voltage V_{CO} that is shifted by the local level shifter 336 (see [0066, 0069-0071]) in the similar way as disclosed by **Kaewell** (see col. 12, lines 17-21 regarding “shifts the levels of the four signals from CMOS levels to RF power control levels to produce actual signals that power up or power down the circuit components of RF section”). Therefore, it is clear that the <u>data bits transfer to register of serial interface 332 would obviously comprise ON/OFF (or 1/0) bits control signal for each component associated with data latches 334</u> (up to 24 bits as disclosed in

[0065]), and the data latches would then provide control signals at V_{BO} to the local level shifter 336 to act in accordance with ON/OFF control signal. Therefore, “the data 326” (Fig. 3, [0072]) comprising data bits for transferring to register of serial interface 332 would cause different control voltage V_{CO} for each component in the RF section via latches and level shifters, and would read on the claimed “power control message”,

- wherein the RF section includes a register for receiving the power control message from the baseband section and wherein devices to be controlled by the power control message are coupled to the register to receive respective power control data from the received power control message (see Fig. 3, and [0064, 0072] regarding registers of SI 332 for receiving baseband digital control signal via data connection 326); and
- a data interface for communicating data from the RF section to the baseband section (see Fig. 3 regarding ADC 320);

Therefore, the claimed limitations are made obvious by **Molnar** in view of **Kaewell** regarding the operation of level shifters 336 for shifting baseband digital control signal at V_{BO} to produce the component control signal at V_{CO} that would power up or power down the corresponding component.

Therefore, **Molnar** in view of **Kaewell** would teach all the claimed limitations except for a bi-directional message for the serial interface 332. However, in an analogous art, **Lindlar** teaches a bi-directional message interface for communicating data and control signals (i.e, data, status, an operation mode such as transmit mode, receive mode, or

sleep mode) between the baseband section and the RF section (see Table 1 and col. 2, lines 18-58). Since one skilled in the art would recognize the benefit of the bi-directional message interface in **Lindlar**, it would have been obvious to one skilled in the art at the time the invention was made to modify **Molnar** for providing a bi-directional message to the serial interface in **Molnar** as well, for utilizing advantages of two way communication such as communicating digital control signals between the baseband section and the RF section, for exchanging data, status, information according to the current operation mode of the transceiver.

Regarding claims **2, 4, 8, 11, 13**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, it is clear that **Molnar** would teach a plurality of power control bits (see [0072] regarding each data latch receives **one bit** of data from serial interface) individually specifying power states (ON or OFF bit) for a plurality of pre-selected circuitry in the RF section (see [0070-0072] regarding modulator, converter and synthesizer), in order to control an operating voltage for each component individually.

Regarding claim **3, 12**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, **Molnar** in view of **Kaewell** would teach the power state is one of a power-up state and a power-down state as claimed (see Kaewell, col. 12, lines 17-21 and Molnar [0071]), in order to intermittently shut down RF components.

Regarding claim **5**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, **Molnar** would teach the pre-selected circuitry is at least one of a

frequency divider, oscillator, and amplifier (see Molnar, [0072] which would include at least one oscillator as claimed).

Regarding claims **6, 9**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, **Molnar** would teach the message interface is a serial message interface (see Molnar [0047]).

Regarding claim **7, 10**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, **Molnar** as modified would teach the message interface comprises a message-in signal line, a message-out signal line and a message clock signal line (see **Lindlar**, Table 1 and col. 2, lines 18-58, where a bidirectional signal line would read on message-in and message-out signal line).

3. Claims **14-20, 22-33** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Molnar** in view of **Kaewell** and **Lindlar**, and further in view of **Syrjarinne et al** (US 2003/0107514).

Regarding claim **14**, the claim is rejected for the same reason as set forth in claim 1 above. However, **Molnar** as modified fails to teach a GPS receiver. However, **Syrjarinne** discloses a GPS receiver (see Abstract). Since incorporating a GPS receiver in a mobile phone is well known in the art, it would have been obvious to one skilled in the art at the time the invention was made to further modify **Molnar** for incorporating a GPS receiver to the Molnar's transceiver as suggested by Syrjarine (see [0013]), for utilizing advantages of the GPS receiver such as providing navigation

capability. Note that **Syrjarinne** also suggests a low power standby mode for the GPS receiver for power saving (see [0029-0030]).

Regarding claim **15**, the claim is rejected for the same reason as set forth in claim 14 above. In addition, **Molnar** as modified would teach the message interface comprises a message-in signal line, a message-out signal line and a message clock signal line (see **Lindlar**, Table 1 and col. 2, lines 18-58, where a bidirectional signal line would read on message-in and message-out signal line).

Regarding claim **16**, the claim is rejected for the same reason as set forth in claim 14 above. In addition, **Molnar** would teach a plurality of power control bits (see [0072] regarding each data latch receives one bit of data from serial interface) individually specifying power states for a plurality of pre-selected circuitry in the RF section (see [0070-0072] regarding modulator, converter and synthesizer), in order to control an operating voltage for each component individually.

Regarding claim **17**, the claim is rejected for the same reason as set forth in claim 14 above. In addition, **Molnar** in view of Kaewell would teach the power state is one of a power-up state and a power-down state as claimed (see Kaewell, col. 12, lines 17-21 and Molnar [0071]), in order to intermittently shut down RF components.

Regarding claims **18, 26, 32**, the claims are rejected for the same reason as set forth in claim 14 above. In addition, **Molnar** would teach the power control message comprises a plurality of power control bits individually specifying power states for a plurality of pre-selected circuitry in the RF section as claimed (see **Molnar** [0072]

regarding each data latch receives one bit of data from serial interface. See also **Syrjarinne** [0014], [0037], [0039] through [0042]).

Regarding claim **19**, the claim is rejected for the same reason as set forth in claim 14 above. In addition, **Molnar** would teach the pre-selected circuitry is at least one of a frequency divider, oscillator, and amplifier (see Molnar, [0072] which would include at least one oscillator as claimed).

Regarding claim **20**, the claim is rejected for the same reason as set forth in claim 14 above. In addition, **Molnar** would teach the message interface is a serial message interface which includes a data clock signal line and data bit signal line (see Molnar, Fig. 3, ref. 326 and [0047]. See also **Lindlar**, Table 1 and col. 2, lines 18-58).

Regarding claims **22-33**, the claims are interpreted and rejected for the same reason as set forth in claims 14-20 above, wherein it is clear that the baseband processing section in **Molnar** would obviously comprise <u>at least one</u> address, data, and control line for communicating with a digital device (DSP) as claimed (see Molnar, Fig. 3 and [0046-0047).

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422

F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claim **21** is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. **7,634,025** in view of **Molnar** et al (US 2002/0142741).

Regarding claim **21**, **US 7,634,025** teaches a GPS receiver with a baseband serial interface for providing a bidirectional message serial interface between the RF section and the baseband section (see claims 1-3, 13), which would include all the claimed limitations except for a register to receive power control message from a baseband. However, in an analog art, **Molnar** teaches a serial interface having a register for receiving a baseband power control signal, wherein during the stand-by mode, RF components are placed into a low power consumption standby state (see [0059, 0064, 0072]). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify US **7,634,025** for power down the RF circuit during stand-by mode as suggested by **Molnar** (see [0072]), thereby providing a power control message as claimed, for prolonging battery time of the wireless device.

(10) Response to Argument

In the Appeal Brief filed on 12/22/10, Appellant contends that

VII. ARGUMENT

A. Rejection of claims 1-13 over Molnar in view of Kaewell and Lindlar.

neither Molnar, Kaewall, Lindlar, nor their combination disclose or suggest,

a bi-directional message interface for communicating a power control message from the baseband section to the RF section; and a data interface for communicating data from the RF section to the baseband section, wherein the RF section includes a register for receiving the power control message from the baseband section and wherein devices to be controlled by the power control message are coupled to the register to receive respective power control data from the received power control message, as required by claim 1. Claim 8 includes similar limitations.

Molnar concerns a low-voltage digital interface between a baseband module and a radio-frequency integrated circuit (RFIC) of a wireless communication device.

In the Office Action, it is asserted that Molnar discloses a serial message interface for communicating a power control message from the baseband section to the RFIC that is associated with power consumption of the RFIC. Applicant respectfully disagrees. Molnar does not disclose or suggest sending any power control messages via the serial interface. In support of this assertion, the Examiner points to the Abstract and to paragraphs [0047], [0058], [0059], [0064], and [0072] of Molnar. These paragraphs describe either: 1) a power control method in which the entire radio frequency integrated circuit is "intermittently shutdown" (See Abstract), 2) control signals that constitute the serial interface (i.e. clock, data, latch enable) sent from the baseband module to control the serial interface of the RFIC (See paragraphs [0047], [0064] and [0072]) or 3) data sent from the serial interface to components in the RFIC. (See paragraph [0072]). None of these paragraphs disclose or suggest sending power control messages through the serial interface.

Molnar does not describe the types of messages that are sent via this interface but does indicate several functions of the RFIC that are controlled by the baseband section. The skilled person would understand that at least some of these functions are controlled by the control messages sent through the message interface. The functions of the RFIC that are controlled include the frequency at which the power amplifier operates (see paragraph [0050]), the gain of the low noise amplifier (see paragraph [0051]), whether the antenna is switched to transmit or receive (see paragraph [0052]) and the channel used to transmit or receive (see paragraph [0055]). Molnar does not disclose or suggest controlling power to any of the component devices of the RFIC except through the complete shutdown of the RFIC.

<u>Indeed, Molnar teaches that power control of the RFIC and the other modules in the system is accomplished by the power module 206</u>. For example, paragraph [0040] states:

The module 206 is coupled to a power supply 210. The power supply 210 may be a battery or other power source and may be implemented as a power management integrated circuit (PMIC) on a single die. The power module 206 controls the power supply for all of the other components of the mobile communications device 22.

Similarly, the Abstract states: that the purpose of the second voltage level (VBO standby) is so that the "shifted control signal may be maintained at the component while the radio frequency integrated circuit is intermittently shutdown." <u>This passage indicates that the **entire** radio frequency integrated circuit is shut down</u> except for the serial interface 332 and data latches 334. This understanding of the device described by Molnar is confirmed by the statement of the problem addressed by the invention in paragraph [0008],

In order to conserve power, the radio frequency integrated circuit is typically shut down when it is not in use .... When the radio frequency integrated circuit is powered up, the baseband module has to reconfigure the radio frequency integrated circuit. This results in a great deal of undesirable baseband module programming latency and excessive power consumption.

In addition, Molnar, at paragraph [0060] states,

The low voltage digital interface results in overall power savings for the wireless communication device 22 because test registers and main registers within the radio frequency integrated circuit 338 need not be reprogrammed when powering up the radio frequency integrated circuit 338.

<u>Contrary to the assertion by the Examiner, paragraph [0040] of Molnar, as well as the other cited passages, indicate that power control in the mobile communications device is accomplished using a power management integrated circuit (PMIC). From these passages, the skilled person would understand that the PMIC 206 autonomously controls power to the entire RFIC, except for the power signal VBO</u>

standby which retains the data in the serial interface when the RFIC is shutdown. There is no indication in Molnar that the baseband module sends any power control message to a register in the RFIC wherein devices to be controlled by the power control message are coupled to the register to receive respective power control data from the received power control message. Thus, the skilled person would not understand Molnar as sending power control messages from the baseband module to the power control module.

In response to Applicant's arguments, the Examiner asserts, "however, connection 326 clearly provide (sic) control signals that would control operating voltage Vco of RF components such as demodulator, synthesizer, upconverter, downconverter." Applicants respectfully disagree with this assertion. Connection 326 is the clock, data and latch enable (LE) signals that make up the serial interface between the baseband module and the RF module. There is no indication in Molnar that any of these signals or the data values sent via the data line control the power consumption of any component in the RF section except the serial interface. Indeed, Fig. 4 shows details of the local level shifter (LLS) that is connected to each of the demodulator 384, downconverter 370, synthesizer 354 and modulator/up converter 344. As shown in Fig. 4, Vco is the power signal for the LLS. The output signal of the LLS is not a power signal, as asserted by the examiner but a data signal.

As described above, Molnar indicates that only the power control module 206 performs any power control function. Thus, there is no basis in Molnar to support the Examiner's assertion that Molnar discloses "a serial message interface for communicating a power control message from the baseband section to the RF section."

In response, the Examiner does not agree with Appellant's **speculation** by simply reciting paragraph [0040] based the **power** management integrated circuit (PMIC) "**terminology**" to **allege** that the PMIC would provide power control messages and the baseband **would not** provide the claimed power control messages.

Recall that **Molnar** teaches a method for reducing power consumption of RFIC circuit by intermittently shut down components of the RFIC circuit through the use of the control signal from the baseband module, via data latches, to a plurality of local level shifters (see Abstract), which is included below

ABSTRACT:

A system is disclosed for interfacing a wireless communication device baseband module and a radio frequency integrated circuit. The system accepts a **control signal from the baseband module**. The control signal from the baseband module is generally at a first baseband **voltage**. The first baseband voltage is generally the baseband operating voltage level. The system distributes the control signal, via **data latches**, to a plurality of **local level shifters**. The plurality of local level shifters are associated with **components** of the radio frequency integrated circuit. The local level shifters convert the control signal to a shifted control signal at a second voltage level. The second voltage level is generally the **component operating voltage**. The shifted

control signal may be maintained at the component while the radio frequency integrated circuit is **intermittently shutdown**. The system eliminates the need to reprogram radio frequency integrated circuit components after the **shutdown period**.

As clearly seen from the Abstract and throughout paragraphs [0045 - 0073] in the **Molnar**'s reference, the baseband module 202, data latches 334, local level shifters 336 and low voltage digital interfaces 332 in Fig. 3 are components that are described for intermittently shut down components of the RFIC circuit 338. Here, nowhere in these paragraphs [0045 - 0073] that would mention of the **PMIC** for intermittently shut down components of the RFIC circuit 338. Nowhere in these paragraphs [0045 - 0073] that would mention that only the **entire** RFIC circuit would be shut down.

In fact, **Molnar** teaches that

[0006] The baseband module and the radio frequency module may include separate integrated circuits with different operating characteristics. In general, **the baseband module controls the function of the components of the wireless communication module**, including the components of the radio frequency module. The baseband module controls the radio frequency integrated circuit through a serial logic interface and a plurality of logic control signals. The **baseband** module generally **reconfigures** the radio frequency integrated circuit when the radio frequency integrated circuit is **powered up**.

and further teaches that

[0010] A low voltage digital interface provides a system for interfacing a wireless communication system mobile communication device baseband module with a mobile communication device radio frequency integrated circuit. The low voltage digital interface can be implemented as follows. A serial interface accepts a control signal from a baseband module at the baseband module operating voltage. The control signal includes operating instructions for components of a radio frequency integrated circuit. The serial interface distributes portions of the control signal to data latches that maintain a connection to local level shifters associated with the integrated circuit components. The local level shifters convert the control signals at the baseband module operating voltage to shifted control signals at the operating voltage of the integrated circuit components. **The shifted control signals remain available to the integrated circuit components even when the integrated circuit goes into standby, or shutdown, mode**.

[0047] Baseband module 202 provides control signals to the radio frequency integrated circuit 338 serial interface (SI) 332 via connections 326. Control signals include a clock signal, a data signal, a latch enable signal, and other control signals not shown in FIG. 3. Although shown as originating at bus 312, the control signals may originate from the digital signal processor 310 or from microprocessor 302. Control signals other than those shown as terminating at serial interface 332 may be supplied to a variety of points within the radio frequency module 208. **Baseband module 202 also supplies a baseband standby voltage as voltage V_{BO} to the serial interface 332 via connection 324**. The baseband standby voltage is also supplied to data latches (DL) 334 and local level shifters (LLS) 336 in

the radio frequency integrated circuit 338. It should be noted that, for simplicity, only the basic components of mobile communication device 22 are illustrated.

[0058] The serial interface distributes the baseband **digital control signals** to a plurality of data latches 334. The data latches 334 pass the baseband **digital control signals to the associated components** of the radio frequency integrated circuit 338. The local logic shifters 336 convert the baseband digital control signals at the baseband operating voltage to **component control signals** at the component operating voltage V_{CO}.

[0059] The low voltage digital interface allows for memory based programming retention in the radio frequency integrated circuit 338 with **no power consumption**. The low voltage digital interface allows all but one of the supply voltages for the radio frequency integrated circuit 338 to be **shut down**. The one **supply voltage maintained during shutdown**, the baseband standby voltage at voltage level V_{BO}, maintains a voltage only for memory retention purposes. **The components served by the supply voltage do not draw current in the steady state static condition.** The components only draw current momentarily when the radio frequency integrated circuit 338 is programmed.

[0060] The local level shifters 336 allow for automatic internal level shifting of low voltage baseband digital control signals. The low voltage digital interface results in overall **power savings** for the wireless communication device 22 because test registers and main registers within the radio frequency integrated circuit 338 need not be reprogrammed when powering up the radio frequency integrated circuit 338. Although described with particular reference to a portable transceiver, the low voltage digital interface system can be implemented in any system in which it is desirable to minimize redundant programming and save power.

[0066] **Local level shifters 336 receive baseband digital control signals from one of the plurality of parallel data latches 334**. Local level shifters 336 are also supplied with the baseband supply voltage at V_{BO} and the component control signal voltage at V_{CO} (shown in FIG. 4). The component control signal voltage may be different for the various components of the radio frequency integrated circuit 338 components. **The local level shifters 336 match the baseband digital control signal at V_{BO} to the component control signal at V_{CO}** (FIG. 4).

From the above descriptions, it is clear that that the local level shifters in **Molnar** would supply the operating voltage $\mathbf{V_{CO}}$ to the various components of the radio frequency integrated circuit 338 during the non-shut down period, and would supply the voltage $\mathbf{V_{BO}}$ to the various components of the radio frequency integrated circuit 338 during the shut down period, where the operating voltage $\mathbf{V_{CO}}$ and the voltage $\mathbf{V_{BO}}$ would be **obtained from the baseband digital control signals** via a plurality of data latches 334 (see [0058]). For more **clarification** purpose, the operation of a level shifter in power up and power down a RF circuit is **clearly** described by **Kaewell** (see **col. 12, lines 17-21**).

Therefore, the **baseband digital <u>control</u> signals** to the serial interface 332 in **Molnar** would read on the limitation “a serial message interface for communicating a power control message from the baseband section to the RF section that is associated with power consumption of the RF section” as claimed.

Appellant further contends that

In the Advisory Action, the Examiner asserts that "although Molnar does not explicitly or clearly teach the power down operation of the LLS in [0060], the power down and power up operations of the LLS are clearly described by Kaewell." Applicant respectfully disagrees with this assertion.
Kaewell relates to a subscriber unit of a time-division multiple access (TDMA) radiotelephone system. Kaewell does not disclose or suggest "a serial message interface for communicating a power control message from the baseband section to the RF section." as required by claims 1, 8, 14, 22 and 29. At column 12, lines 21- 36 and in Fig. 2, Kaewell describes a power control circuit 151 that receives four signals, indicating the state of the subscriber unit, and produces four power control signals for the RF Section. As this is a TDMA system, the power control signals have strict timing constraints. (See tables 1 and 2 and Figs. 5 and 6). Because of these constraints, one of ordinary skill in the art would not use a serial interface to transmit messages containing the power commands. First, as shown in Table 1 and Fig. 5, the timing of the switching of the power control signals must occur on a sub- millisecond basis and must be coordinated between the receive and transmit circuitry. It would be difficult to achieve this timing accuracy using a message that takes multiple clock cycles to transmit through a message interface. Second, Kaewell shows these power control signals as being transmitted using dedicated signal lines. The skilled person would not modify Kaewell to replace these dedicated signal lines with a message facility such as that shown in Molnar because the timing of the various signals could not be controlled with the precision required for TDMA operation. Thus, Kaewell does not provide the material that is missing from Molnar.

In response to applicant’s argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007).

In this case, the **Kaewell's** teaching is used solely for its teaching that is clearly showing the operation of a **local level shifter** (LLS) in power up and power down operations of an RF circuit (see **col. 12, lines 17-21**), **Kaewell** is not used for teaching of a "serial message interface" which has been taught by **Molnar**. In addition, the serial message interface would applicable to any system, including a TDMA system. The allegation that the serial message interface **does not work** in a TDMA system is merely Applicant's **speculation**.

Here, since **Molnar** does teach the power up operation of the LLS (see [**0070-0071**]) regarding operating voltage V_{CO}), **Molnar** would obviously, if not implicitly, teach the power down operation as well for the LLS (provide only standby voltage V_{BO} for memory retention purpose during the shut down period).

Furthermore, if the message facility in Molnar were used to control power of components of the RFIC, it would defeat the purpose of Molnar. As described above, the data latches in Molnar remain powered up when the RFIC is shutdown to hold the configuration data while the RFIC is powered down. If the configuration data stored in these latches were the commands to power down components of the RFIC then the configuration data for the RFIC would need to be reloaded after the baseband module had reconfigured the components with a power up message. Thus, the combination of Molnar and Kaewell would defeat the purpose of Molnar. It is well settled that if a combination of references defeats the purpose of the primary reference then the combination is invalid.

In response, it is not clear what feature or what constrain would defeat **Molnar**'s purpose in the above argument. However, the data latches in **Molnar** that remain powered at V_{BO} for memory retention purpose when the RFIC is shutdown would result in the claimed power consumption (see Molnar, [0059]). The teaching of several data latches, **each** associated with a level shifter for **each** component of the RFIC circuit in **Molnar** (see Fig. 3) clearly suggests each component can be independently shut down.

If the proposed modification or combination of the prior art would change the principle of operation of the

prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious.
Lindlar concerns an interface between baseband circuitry and RF circuitry in a Bluetooth device. The Lindlar system does not disclose or suggest "a serial message interface for communicating a power control message from the baseband section to the RF section." Instead, Lindlar teaches the use individual power control signals having dedicated signal lines. In the Office Action, two power control elements are identified 1) the signal SleepX which removes power from the entire RF section and 2) the signal PAON which controls power to the power amplifier 276. Neither of these signals is a part of a "message" as the term would be understood by a skilled person upon reading the subject patent application nor is it communicated from the baseband section to the RF section via "a serial message interface," as required by claims 1 and 8.

In response, the examiner asserts that there is nothing in the specification that would provide a description such that one skilled in the art would recognize that a message and a signal in a serial interface are two different “entities”. Here, Appellant has failed to provide or point out such difference or distinction except for the “**terminology**” argument, whereas the claim should be interpreted with the broadest reasonable interpretation. In fact, the “**message clock signal** MSG_CLK” as used in the specification is just a “clock enable signal” of a serial interface widely used in prior art.

The signal SleepX in Lindlar is identified as a signal at column 2, lines 51-53. As shown in Figs. la and lb of Lindlar, the SleepX signal is generated in the baseband circuitry 100, transmitted to the RF circuitry using a dedicated signal line 14 of the interface 10 between the baseband circuitry 100 and the RF circuitry 200. The signal SleepX is logically combined with signals internal to the RF circuitry 200 before being applied to the power supply regulator 240 and reference oscillator 250 in the RF circuitry 200. As shown in Fig. lc, the signal PAON is provided via RF Bus2 in transmit mode and applied directly to the power amplifier 276. At column 7, lines 1-7, Lindlar identifies PAON as a signal and states that "[t]he switching on and off of the Power Amplifier is 'time critical' as it must be controlled over time scales of less than 1 bit duration." Thus, the skilled person would understand that the PAON signal could not be a part of a power control message communicated via a serial message interface from the baseband section to the RF section because such an interface could not meet these strict timing requirements. Accordingly, Lindlar teaches away from any combination with Molnar.
In the Office Action, it is asserted that "Lindlar does teach a bi-directional serial message interface for communicating data and control signals (i.e. data, status, an operation mode such as transmit mode, receive mode, or sleep mode) between the baseband section and the RF section (see Table 1, and col. 2, lines 18- 58)." Applicant respectfully disagrees with this assertion inasmuch as it states that the sleep mode is controlled via the serial message. As disclosed in Lindlar, the bidirectional portion of the interface does not transfer any power control messages. There are two bidirectional lines, DBusDa and RFBusl. The only described power control signal in this interface is the signal SleepX, which, as described above,

is a dedicated signal, and is unidirectional from the baseband section to the RF section. The functions of the DBus lines and RFBus lines are described at column 2, line 60 through column 5, line 21. None of these functions is a power control function. Thus, the Lindlar reference does not disclose or suggest a bidirectional message interface for communicating a power control message from the baseband section to the RF section and, so, can not provide the material that is missing from Molnar and Kaewell.
Claim 1 further recites, that the "the RF section includes a register for receiving the power control message from the baseband section and wherein devices to be controlled by the power control message are coupled to the register to receive respective power control data from the received power control message." Similarly, claim 8 recites, "storing the power control message in a register internal to the RF section wherein devices to be controlled by the power control message are coupled to MPEP §2143.01(VI) quoting In re Ratti, 123 USPQ 349 270 F.2d 810 (CCPA 1959) the register to receive respective power control data from the stored power control message." Neither Molnar, Kaewell, Lindlar nor their combination disclose or suggest such a register which stores a power control message wherein the devices to be controlled by the power control message are coupled to the register to receive respective power control data. This register, which stores the message provided by the baseband section according to the subject application, illustrates the difference between a **message** according to claims 1 and 8 of the subject invention, and the **signals** used in Lindlar.
Using a message to transfer power control messages rather than dedicated signal lines or a separate power control module has the advantage of reducing the number of signal lines between the baseband and RF sections. In Lindlar, separate signal lines are required for the SleepX and PAON signals. In Kaewell, dedicated signal lines are used to convey the power control signals -Ix, Rx, LB and PAEN. Power control of more than one device in the RF section, according to Lindlar or Kaewell, would require a separate signal line for each device. According to the subject invention, however, power control messages are sent between the baseband and RF sections via a single message interface and are received by a register. The devices to be controlled by the power control message are coupled to the register to receive respective power control data from the received power control message.
In the Office Action dated July 2, 2010, at page 13, the examiner asserts that "although 'message' and 'signal' are two different terminologies, they are both meaning the same for Molnar and the claimed invention because they both provide control bits in a message/signal to a serial interface for controlling power of RF components." Applicant notes that pursuant to MPEP section 2181, "claim language must be analyzed not in a vacuum but in light of: (A) the content of the particular application disclosure; (B) the teachings of the prior art; and (C) the claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made." As set forth above, the claims explicitly recite "a power control message," also as set forth above, **there are significant differences between messages and signals**. As described above, in Molnar, the message interface is used to configure the RF unit, not to control its power state. In Kaewell and Lindlar, signals are used to control power due to the timing constraints on switching on and off the devices in the RF section. Thus, "message" and "signal" are different concepts and may not be conflated. Consequently, in view of the teachings of the specification, the words used in the claim, and the teachings of Kaewell and Lindlar, the Examiner is not entitled to ignore the word "message" when interpreting the claim.

In response, the examiner asserts that there is nothing in the specification that would provide a description such that one skilled in the art would recognize that a **message** and a **signal** in a serial interface are two different “entities”. Here, Appellant has failed to provide or point out such difference or distinction except for the “**terminology**” argument, whereas the claim should be interpreted with the broadest

reasonable interpretation. In fact, the "**message clock** signal MSG_CLK" as "**terminology**" used in the specification is just a "**clock** (enable) **signal**" of a serial interface that is **widely used** in prior art for controlling read/write operations of the serial interface.

In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007).

In this case, **Kaewell's** reference is used solely for its teaching that describes **clearly** of the "operation of a level shifter" in power up or power down a circuit, not for teaching of a "serial message interface" which has been taught by **Molnar**. Further, **Lindlar's** reference is used solely for its teaching of a bidirectional message/signal in a serial interface, regardless of whether such message/signal is for "power control" which has been taught by **Molnar**.

Furthermore the Examiner has not provided any "articulated reasoning with rational underpinning" to support the modification of Molnar by Kaewell and Lindlar. 2 Indeed, the Examiner has not provided reason why a skilled person would modify Molnar to include the teachings of Kaewell and Lindlar. Thus, the Examiner has failed to properly state a case of prima facie obviousness and the combination of Molnar and Kaewell is improper. (See MPEP § 2142).

In response, it is clear that **Kaewell's** reference is used solely for its teaching that describes **clearly** of the "operation of a level shifter" in power up or power down a circuit. Since **Molnar** does teach the power up operation of the level shifter LLS (see [**0070-0071**]) regarding operating voltage V_{CO}), **Molnar** would obviously, if not implicitly, teach the power down operation as well for the LLS (provide only standby voltage V_{BO} for memory retention purpose during the shut down period).

Lindlar's reference is used solely for its teaching of a bidirectional message or signal in a serial interface. Since one skilled in the art would recognize the benefit of a bi-directional message/signal in **Lindlar**, it would have been obvious to one skilled in the art at the time the invention was made to modify **Molnar** for providing a bi-directional message to the serial interface in **Molnar** as well, for utilizing advantages of two way communication such as communicating digital control signals between the baseband section and the RF section, for exchanging data, status, information according to the current operation mode of the transceiver.

Appellant further contends that

B. Rejection of claims 7 and 10 in view of Molnar and Kaewell.
Claim 7 further defines the message interface as including "a message-in signal line, a message-out signal line and a message clock signal line." Similarly, claim 10 recites that "the step of communicating comprises the step of serially communicating the power control message using a message-in signal line, a message-out signal line and a message clock signal line." The serial interface in Molnar includes only one data line, which corresponds to the message out signal line of the subject invention as defined by claims 7 and 10. Molnar does not disclose or suggest a message interface including both a message-out signal line and a message in signal line. Kaewell does not disclose any message interface and, so, can not provide the material that is missing from Molnar. Lindlar discloses a single bidirectional control signal line DBusDa rather than the separate message-in and message-out signal lines required by claims 7 and 10. Thus, the subject invention as defined by claims 7 and 10 is patentable over Molnar, Kaewell and Lindlar for reasons independent of claim 1. [R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational

underpinning to support the legal conclusion of obviousness. 550 US 398 at 418 (2007) (citing In re Kahn, 441 F.3d at 988 82 USPQ2d at 1396. MPEP 2141 (III)

In response, the message-out signal line in **Molnar** as modified for a **bidirectional** signal would further comprise a message-in signal line (see **Lindlar**, Table 1 and col. 2, lines 18-58, where a bidirectional signal line would read on message-in and message-out signal line).

Appellant further contends that

C. Rejection of claims 14-20 and 22-33 in view of Molnar, Kaewell, Lindlar and Syrjarinne.

Claims 14, 22 and 28 include limitations similar to those described above with reference to claims 1 and 8. Accordingly, claims 14, 22 and 28 are not subject to rejection under 35 U.S.C. § 103(a) in view of Molnar, Kaewell and Lindlar for at least the reasons set forth above. In particular, neither Molnar, Kaewell, Lindlar nor their combination disclose or suggest,a bi-directional message interface for communicating messages between the RF processing section and a baseband processing section, including receiving a power control message from the baseband processing section wherein the power control message is associated with power consumption of the RF processing section, wherein the RF section includes a register for receiving the power control message from the baseband section and wherein devices to be controlled by the power control message are coupled to the register to receive respective power control data from the received power control message, as required by claim 14. Claims 22 and 28 include similar recitations. Syrjarinne was cited as disclosing a GPS receiver. In addition, in the Office Action, it is asserted that Syrjarinne discloses a low power standby mode for the GPS receiver for power saving. The power control in Syrjarinne, however, is implemented using a power control module that monitors the mode mix provided by the mode selector to define appropriate on-off duty cycles for the RF front end and baseband processor. The power control is implemented entirely in the power control module (See paragraphs [0030] and [0039]-[0043]). Syrjarinne, like Molnar, discloses **only** shutting down the **entire** RF front end. While paragraphs [0040] and [0041] of Syrjarinne appear to disclose selectively powering down components of the GPS receiver, there is no suggestion that any of these **components would be internal to the RF front end**. Indeed, the RF front end is regarded as a single component by Syrjarinne. In paragraph [0040], for example, Syrjarinne discloses that, when a poor constellation exists, hardware used or provide any channels not being used to track satellites because of a poor constellation, can be powered down and not powered up until the constellation improves. This statement in Syrjarinne indicates that the **entire** RF front end would be shut down until the constellation improves.
Thus, the combination of Molnar, Kaewell, Lindlar and Syrjarinne can not disclose or suggest:
a bi-directional message interface for communicating messages between the RF processing section and a baseband processing section, including receiving a power control message from the baseband processing section wherein the power control message is associated with power consumption of the RF processing section, wherein the RF section includes a register for receiving the power control message from the baseband section and wherein devices to be controlled by the power control message are coupled to the register to receive respective power control data from the received power control message,

as required by claims 14, 22 and 28. Consequently, Syrjarinne can not provide the material that is missing from Molnar, Kaewell and Lindlar.

In response, the examiner asserts that the allegation that "Syrjarinne, like Molnar, discloses **only** shutting down the **entire** RF front end" is just an Appellant's **speculation**. However, just for the sake of arguments, "shutting down the **entire** RF front end" still read on limitations of independent claims 1, 14, 28. In fact, the teaching of several data latches, **each** associated with a level shifter for **each** component of the RFIC circuit in **Molnar** (see Fig. 3) clearly suggests each component can be independently shut down. In addition, **Syrjarinne** clearly teaches selectively powering down components of the GPS receiver (see **Syrjarinne** [0014], [0037], [0039] through [0042]).

Furthermore, the Examiner has not provided any "articulated reasoning with rational underpinnings" to support the combination of Syrjarinne with any of the other references. Thus, the Examiner has failed to state a prima facie case of obviousness. The statement supporting the combination of Molnar, Kaewell, Lindlar and Syrjarinne is a mere conclusory statement that Molnar would use Syrjarinne's device to obtain GPS navigation capability. This statement does not describe how or why the skilled person would integrate the GPS capabilities of Syrjarinne with the communication devices of Molnar, Kaewell and Lindlar or why such a combination would be successful.
Because neither Molnar, Lindlar, Kaewell nor Syrjarinne either alone or in combination disclose or suggest these limitations of claims 14, 22 and 28 and because claims 14-20 depend from claim 14; claims 23- 27 depend from claim 22 and claims 29- 33 depend from claim 28, these claims are not subject to rejection under 35 U.S.C. § 103(a) in view of Molnar, Kaewell, Lindlar and Syrjarinne.

In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir.

1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, the motivation for providing a GPS receiver in a mobile phone is for navigation purpose, this motivation is found in the references themselves, <u>that is GPS for navigation</u>, for further enhancing features of a mobile phone to support user needs.

D, Rejection of claims 15, 23 and 29 in view of Molnar, Kaewell, Lindlar and Syrjarinne.
Claims 15, 23 and 29 further define the message interface as including "a message clock line, a message-in signal line and a message-out signal line," The serial interface in Molnar includes only one unidirectional data line, which corresponds to the message out signal line of the subject invention as defined by claims 15, 23 and 29. Similarly, Syrjarinne shows a single unidirectional control signal line between the baseband processor and the RF front end. Thus, neither Molnar nor Syrjarinne disclose or suggest a message interface including both a message-out signal line and a message in signal line. Kaewell does not disclose any message interface and, so, can not provide the material that is missing from Molnar. Lindlar discloses a single bidirectional control signal line DBusDa rather than the separate message-in and message-out signal lines, required by claims 7 and 10. Thus, the subject invention as defined by claims 15, 23 and 29 is patentable over Molnar, Kaewell and Lindlar for reasons independent of claims 14, 22 and 28.

In response, the message-out signal line in **Molnar** as modified for a bidirectional signal would further comprise a message-in signal line (see **Lindlar**, Table 1 and col. 2, lines 18-58, where a bidirectional signal line would read on message-in and message-out signal line).

E, Rejection of claim 21 for nonstatutory/obviousness-type double patenting in view of claims 1-3 of U.S. patent no. 7,634,025 and Molnar.
Claim 21 is not subject to rejection for nonstatutory obviousness-type double patenting in view of claims 1-3 of Patent no. 7,634,025 and Molnar. In the Office Action dated July 2, 2010, it is admitted that claims 1-3 of Patent no. 7,634,025 do not include a register to receive power control messages from a baseband unit. The Office Action cited Molnar as disclosing this feature. As set forth above, however, this feature is not disclosed or suggested by Molnar. Contrary to the Examiner's assertion, Molnar does not disclose or suggest any register that receives power control messages. Applicant further notes that, as described above, while Molnar does disclose a serial message interface, it does not disclose communicating power control messages from the baseband section to the RF section using this interface. This limitations is also absent from claims 1-3 of U.S. Patent no. 7,634,025. Consequently, claim 21 is not subject to rejection for nonstatutory obviousness-type double patenting in view of claims 1-3 Patent no. 7,634,025 and Molnar.

In response, the examiner asserts that **Molnar** does teach communicating power control messages from the baseband section to the RF section using a serial interface for the same reason as set forth above for claim 1 (see also Abstract, Fig. 3), and further teach registers as claimed (see [0059, 0064, 0072]).

For foregoing reasons, the examiner believes that the pending claims are not allowable over the cited prior art.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Duc M. Nguyen/

Primary Examiner, Art Unit 2618

2/14/2011

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